
Chapter 9

Housing

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Shelter is a basic human need. Thus, providing adequate housing is a fundamental development objective. It is also one of the most complex. Successful housing activities can rarely be isolated from the development of associated infrastructure—e.g., water, sanitation, transport—and social services.

This section focuses on housing reconstruction after natural disasters—when pursuing an integrated approach is particularly difficult. The section does not address technical standards for construction of housing units, water supply and treatment, etc. Instead, its purpose is (1) to convey the full range of environmental and environmental health issues associated with housing construction, and (2) to provide a guided framework for considering these issues in the siting, design and implementation of housing projects, particularly in post-disaster reconstruction and in risk-prone areas.

Note: Readers should also review the following sector briefings: water and sanitation, solid waste, rural roads, and small-scale construction.

Brief Description of the Sector

Many areas in the Asia and Near East region have been wracked by civil strife, or because of geology and geography are highly vulnerable to floods, extreme rainfall, cyclones and volcanic eruptions. Such man-made and natural disasters can have disastrous effects on houses and other dwellings, accompanied by large loss of life and persistent hardship for displaced persons.

Reconstruction needs arise in both urban/peri-urban and rural areas. Natural disasters in densely populated urban areas can be particularly devastating. Typically, the urban poor are disproportionately affected by any natural disaster—both because they tend to occupy poor-quality housing stock in high-risk areas (e.g., flood plains or steep slopes) which are, even in the best of times, poorly served by municipal services, and because they lack the resources to rebuild after a disaster.

The ultimate impact of housing projects extends beyond the construction or reconstruction phase. The existence of housing tends to attract both economic activity and additional settlement. Thus, the environmental and environmental health impacts of the original project are typically amplified by its expansion over time.

Housing reconstruction in rural areas after a natural disaster is also a real and pressing issue. Rural reconstruction needs are often more difficult to assess than those in and around cities. Even in the absence of natural disasters, living standards in rural areas are lower than in urban ones. Failure to address rural post-disaster housing and infrastructure needs can only encourage further out-migration from rural areas and weaken agricultural productivity.



Housing projects can have significant environmental impacts, but can also help mitigate poor existing condition caused by building on slopes, in watersheds or in flood prone areas.

Potential Environmental Impacts of Housing Projects

- Destruction of important ecological, archaeological or historical areas
- Deforestation
- Contamination of soil or water resources
- Erosion

Potential Environmental Impacts of Housing Reconstruction and Their Causes

A fundamental issue facing post-disaster reconstruction efforts is whether to rebuild/repair housing where it was (“in-place”) or develop a new site. In densely populated urban areas, there may be little choice but to pursue reconstruction in-place. In either case, the environmental impact of housing development comes from the permanent occupation of the land by built structures and the introduction of domestic waste streams into the environment. Well-planned and -implemented housing projects have far fewer impacts—and result in much healthier populations—than unplanned or poorly planned housing development.

In the case of a new settlement, the housing actually constructed by the activity will cause some level of impact. However, the *ultimate* impacts may be significantly larger. The existence of the new housing tends to attract both economic activity and additional settlement. Thus, the environmental and environmental health impacts of the original project are typically amplified by its expansion over time.

Potential impacts arising from land development and the introduction of human waste streams and resource demands include:

- Destruction of important ecological, archeological or historical areas. This may be caused either by land clearing for the housing and associated infrastructure, or by the subsequent exploitation of the land and other resources by inhabitants.

- Deforestation, arising from (1) clearing of land for construction and associated infrastructure (e.g., roads); (2) clearing of land for agriculture by inhabitants; or (3) overharvesting of fuelwood by inhabitants, for domestic use or for small-scale charcoal production.
- Contamination of soil, surface water and groundwater from sewage and solid waste (refer to the “Water and Sanitation” sector description in the Guidelines); creation of breeding grounds for animal and insect disease carriers.
- Erosion from construction of houses and access roads, resulting in destruction of agricultural land, sedimentation of waterways, etc.

Construction impacts. Construction also has serious environmental impacts. These are discussed at greater length in the general sector briefing on “Small-Scale Construction” in the *Guidelines*. Prominent among these impacts are:

- Erosion, caused by water or wind and aggravated by sloping terrain when the earth is left barren after the site is cleared, leveled or filled in. Erosion may also be associated with access roads, or with quarry or borrow areas that provide construction material.
- Water contamination, from (1) the dumping of demolition debris or excess soil from land leveling into watercourses; (2) runoff from on-site machine maintenance (oil change, refueling, washing) affecting surface and groundwater supplies; and (3) lack of adequate sanitary facilities for construction workers.
- Airborne dust and particulate contamination, caused by removal of ground cover from access roads, quarries, borrow pits and construction sites.
- Destruction or depletion of local natural resources, such as sand and rock taken from riverbeds, quarries or borrow areas and wood cut from neighboring forests for construction or for firing brick-making.
- Loss of hillside stability caused by the removal of vegetation cover, water saturation from altered drainage, and poorly designed quarries and borrow pits; results include landslides and slumping.
- Creation of an environment favoring disease vectors. For example, demolition rubble may serve as a breeding ground for rats; standing water may serve as a breeding ground for insect vectors and harbor water-borne diseases.
- Marring of viewsheds and aesthetic qualities by failure to properly dispose of construction and demolition waste (including trash produced by workers) and by scarring associated with quarries and borrow pits for construction materials.

Environmental Damage from Housing Construction

- Erosion, particularly from quarries or borrow pits
- Water contamination
- Airborne dust and particulate contamination
- Destruction or depletion of local natural resources
- Loss of stability on slopes and hillsides
- Creation of areas where disease bearing insects and animals can breed
- Destroying or damaging scenic vistas

Environmental Damage from Built Housing

- Inadequate or non-existent sanitation
- Natural disasters, such as floods or landslides
- Dangerous or polluting local industries and activities
- Standing water, creating breeding grounds for disease-bearing insect
- Unhealthy conditions inside houses from poor design or construction

In general, the consequences of these impacts persist after construction is complete. Eroded land does not regain its fertility. Contaminated waterways will recover only slowly.

Impacts of the built environment. As noted above, housing construction changes the natural environment. But housing also *creates a built environment* for its inhabitants. Badly planned and constructed housing/settlements can create severe environmental health hazards for both the existing population and new inhabitants.

Environmental health issues include:

- Inadequate or absent sanitation facilities (water, sewage and solid waste disposal), leading to higher rates of diseases borne by oral-fecal transmission and by insect and animal vectors (e.g., mosquitoes, rats).
- Possible natural dangers—e.g., landslides and flooding.
- Dangerous prior or ongoing human activity near the site—such as highly polluting industrial, mining or farm operations, military operations, etc.
- Creation of standing water due to poorly constructed drainage systems or abandoned borrow pits, with associated increases in vector-borne disease.
- Unhealthy interior conditions due to improper house design or to construction materials that are inappropriate for the local climate and anticipated use of spaces within the home (e.g., creating interior conditions that are either too hot or too cold, or improper ventilation for heating or cooking).

Impacts on environmental resources. Creation of a new housing settlement can also affect the environmental resources available to the *existing population* in the area, particularly in rural locales, from:

- increased competition with new residents for water, forest resources (including fuelwood and game), and/or farmland.
- complete loss of access to resources or farmland, as a result of land clearance for the project itself, changes in land tenure, etc.
- degradation of land and—particularly downstream—of water resources.

Damage to Environmental Resources from Housing Projects

- Increased competition from residents for local resources, such as firewood
- Loss of access to farmland
- Degradation of land and water resources

Finally, the new housing development's built environment can put pressure on the resources available to the existing population—for example, by overloading transportation, power and water supply systems and crowding schools and health centers. This applies to both urban and rural environments.

Assessing the environmental impacts of a housing project requires knowledge of the baseline situation—in other words, the impacts of a proposed project must be assessed against what would happen without the project. In the case of housing projects, baseline assessment can be a particularly difficult proposition. The alternative to planned reconstruction may be unplanned and ad hoc resettlement of the site, reproducing—or even worsening—preexisting public health hazards and the poor construction practices which may have contributed to the disaster in the first place.

Sector Program Design—Some Specific Guidance

Overview

Land tenure. Resolving outstanding land tenure issues is an absolute necessity for any project. Obviously, it is critical to the project's general viability. In addition, any environmental and environmental health protections put in place by the project can be counteracted by those with legal claims on the land. However, resolving land tenure questions is rarely straightforward.

Governance and maintenance. Ongoing mitigation of environmental and environmental health impacts—as well as the benefits and services individuals derive from the built environment—is contingent upon proper maintenance and good community governance. In some cases, reconstruction will occur within a community that already has an effective, pre-existing governance system. In other cases, new community institutions must be established. Large-scale reconstruction efforts, or those that involve building a new community, should include a complete Community Development Plan (CDP), including the following elements as a minimum:

- *Administration of standard services and maintenance.* This should include responsibility for providing potable water supply systems, sanitation facilities, solid waste disposal systems, transportation, and cooking, educational and health facilities.
- *Provision of social services.* Community counseling in topics such as adapting to change and living in a community (especially important for resettlement/disaster relief-related housing); communal organization services (aid in the formation of civic associations, water boards, etc.); educational activities in water storage and latrine maintenance; in health and nutrition; in the construction, use and maintenance of fuel efficient stoves; as well as job assessment programs that include training and placement.
- *Establishment of a coordinating committee.* It is imperative that a functional group be established with the technical, organizational and administrative capacity to execute the development plan. Ideally, the committee should include an NGO representative, community representatives, local school representatives, a social worker and a municipal authority.

Design Elements for Successful Housing Projects

- Resolve outstanding land tenure issues
- Ensure proper maintenance and community governance
- Begin design with good baseline data on the community
- Always complete a preliminary project design
- Use baseline data and project design to anticipate environmental problems

- *Supervision and monitoring program.* Regular on-site visits, surveys and quality testing of the facilities are needed to ensure their proper functioning. The Coordinating Committee should provide necessary oversight.

Starting the design process with sound baseline data. Because the various housing activities—construction, facilities planning, etc.—are highly integrated, and because their impacts depend in large part on the *social and economic behaviors* of stakeholder populations, those designing and implementing activities must develop as complete a baseline as possible, describing both current and historical environmental and social conditions.

Two baseline surveys are highly recommended: (1) A social survey, to be administered both to future occupants (if known) and to the existing local population, and (2) an environmental baseline survey of the project site. Samples of these surveys are included at the end of this module.

Setting out a preliminary project design. Following the baseline surveys, a preliminary project profile is developed. The profile contains basic information about the preliminary design of the housing project, and should be filled out *before the project plan is finalized and any construction is undertaken*. (A template profile is also included at the end of this module.)

Using the preliminary design and baseline data to identify environmental concerns. Taken together, the baseline surveys and the project profile allow the most critical questions about the project's impacts to be answered. These questions are presented in the checklists found below. The checklists identify the most likely adverse impacts from a proposed project or program, and point to needed mitigation measures.

Those responsible for the project **MUST** be willing to adjust the project to address the critical problems identified by the checklists. *If the project design is not adjusted in response to identified concerns, then the entire environmental assessment process is meaningless.* Mitigation options are identified in the tables immediately following the checklists.

Key questions: site and design

Note that the surveys and the project design assume construction of new housing units, rather than repair of existing structures. Checklists should be modified for projects oriented toward repair only.

These checklists should be answered using information from the baseline surveys and the project profile. Adverse impacts can be indicated as significant or moderate. For each **significant** adverse impact, a mitigation measure should be considered mandatory. For each moderate adverse impact, mitigation should be considered. Mitigation measures are presented in the final section of this sector briefing.

	Yes		No
	Significant Adverse Impact expected if no mitigation measures are applied	Moderate Adverse Impact expected if no mitigation measures are applied	
Will the project have reasonably foreseeable impacts on endangered or endemic species?			
Are any hazardous or highly polluting activities foreseen, or currently taking place, in the surrounding areas?			
Could previous land use put the future population at risk?			
Did the environmental survey identify any other local problems or issues? If so, specify _____			
Is the site at moderate or high risk from natural hazards?			
Does the site slope exceed 20%?			
Associated construction: <ul style="list-style-type: none"> Will an access road need to be created or rehabilitated? Will electricity transmission/generation infrastructure need to be constructed? Will water supply and treatment infrastructure need to be constructed? 			

	Yes		No
	Significant Adverse Impact expected if no mitigation measures are applied	Moderate Adverse Impact expected if no mitigation measures are applied	
Does the proposed potable water system meet estimated water requirements for the present and future population?			
If no, are complementary water sources available?			

	Yes		No
	Significant Adverse Impact expected if no mitigation measures are applied	Moderate Adverse Impact expected if no mitigation measures are applied	
Does the potable water quality meet relevant national or funding agency standards?			
Has the lighting source and distribution system been taken into account in the design and layout of the project?			
Is the cooking fuel available proportionate to the demands of the community?			
Has a solid waste disposal system been designed for the site?			
Will the solid waste disposal system meet relevant standards and has it been designed with future growth in mind?			
Has a sewage/graywater disposal system been included in the design?			
Will the effluent from the water disposal system meet relevant national or funding agency standards?			
Are the building materials adequate for the local weather conditions? Does construction embody appropriate earthquake resistance?			
Have provisions been made to ensure adequate occupant comfort in hot and cold seasons?			
Has the predominant wind direction been considered in the design of the project houses?			
Has the predominant wind direction been considered in the design of the waste disposal and sewage systems?			
Does the design and layout include the following elements, and do their type and quantity which meet relevant standards?			
• Internal roads			
• Green areas			
• Social and recreational areas			
• Fire prevention			
• Transportation			
Does the design accommodate future expansion? (Factors include growth in population, expansion of individual houses, and future utility service connections.)			
Is house design consistent with that of other housing projects or existing housing in the area? (Social problems may arise from the differences in quality of the houses and services provided)			

Key questions: construction management

If the answer is “no,” no further action is needed. For each significant impact, an adequate mitigation measure must be implemented. For each moderate impact, some mitigation should be considered. See the sections on small-scale construction and rural roads for further discussion on construction project management.

	Yes		No or N/A
	Significant Impact expected if no mitigation actions are applied	Moderate Impact expected if no mitigation actions are applied	
Will construction activities likely produce significant:			
• Erosion?			
• Water contamination?			
• Airborne dust and particulate contamination?			
• Deforestation?			
• Loss of habitat or biodiversity?			
• Effects on threatened or endangered species?			
• Hillside instability/landslide risk?			
• Noise?			
▪ Obstruction to roads or other existing transportation?			
▪ Construction or demolition waste?			
Will on-site water resources be used to satisfy construction needs?			
Are potentially hazardous construction techniques to be employed with serious risk to worker safety? (e.g., felling of large trees, blasting, large-scale excavation, construction of bridges and towers)			
Will laborers coming into the area require food and housing?			
Will laborers coming into the area plausibly increase the incidence of certain communicable diseases in the local population—e.g., malaria, tuberculosis, or HIV/AIDS?			

Key questions: habitation and community governance

Once people move into a housing project, long-term impacts (beneficial or adverse) will develop, affecting the inhabitants, the surrounding communities and the environment. Careful thought must be given to ensure that the project will have a positive and lasting influence on the area. Mark the answer that will best fit the project characteristics. For every “No,” a clearly defined plan should be designed and ready to implement before the houses are officially transferred to the new inhabitants.

	Yes	No
Will a management structure for the community be in place before the houses are occupied?		
Will the basic facilities (latrines, potable water, graywater and solid waste disposal) be ready for use by the time the houses are inhabited?		
Will there be any training in the use of these sanitary facilities for the project population?		
Have the parties responsible for the operation and maintenance of the facilities been identified and trained?		
Is there an established basic service billing system?		
Has the party responsible for the billing system been identified and trained?		

Environmental Mitigation and Monitoring Issues

Site and design

Potential Adverse Impact	Mitigation Measures
Change in land use pattern	Ensure that present land use at the proposed project site is not critical and that the present activities can be carried out on nearby land before the site is selected.
Destruction of important ecological, archeological or historical areas	<p>Before the site is selected, verify that biodiversity, conservation of endangered or endemic species or critical ecosystems will not be adversely affected.</p> <p>Likewise, verify that no important archeological, historical or cultural sites will be adversely affected by the project.</p> <p>An alternative site should be used if the area is identified as critical.</p>
Contamination of soil and water from sewage and solid waste	Site human waste and solid waste disposal systems to avoid surface and groundwater contamination, taking soil characteristics and historical groundwater and surface water conditions into account. Install adequate and appropriate sewage and solid waste disposal systems (e.g., use above-ground composting latrines in areas with high water tables).
Risk to residents due to possible natural dangers	<p>Ensure that proposed project site is not located in areas:</p> <ul style="list-style-type: none"> • subject to landslides • subject to fires • subject to flooding • with slopes over 20% • below areas likely to undergo significant deforestation or land clearing <p>If the site is in an area subject to these natural dangers, an alternate site should be used. If no appropriate alternative can be found, mitigation measures must be taken to minimize risk in areas where it is unavoidable (e.g., construct firebreaks, stabilize slopes, construct drainage, elevate housing units on pilings, etc).</p>
Risks to residents due to human activity near site	<p>Before the site is selected:</p> <ul style="list-style-type: none"> ▪ Ensure that the project will not be located within the area of influence (normally 1 km) of pollution and hazardous waste sources, including factories, mines, military bases, etc. ▪ Insure that the project is not downwind of a contamination source. ▪ If groundwater is to be used for drinking, test it for chemical and microbial contamination if there is any reason to doubt its purity. ▪ Identify and eliminate sources of noise pollution. ▪ Use alternate site if risk to residents is high.
Excessive use and pressure on existing facilities such as schools and health centers	Include the expansion or construction of any necessary infrastructure in the layout and design of the project, if needed.
Deforestation in order to implement project	<p>If forest is dense or forms part of a critical habitat, an alternative site must be found.</p> <p>A forested area equal in size to one and a half to two times the area deforested must be established and maintained. The location and ultimate use of this protected area will be established in coordination with local municipal authorities.</p> <p>For each tree cut in a sparsely forested area, plant 20 new trees. This should be done no later than 6 months after the residents have moved in.</p>
Excessive use of fuelwood as an energy source	<p>Encourage use of alternative energy sources such as gas, electricity and solar.</p> <p>If fuelwood is the dominant energy source, include the planting of fuelwood plots using local species in the project layout and design.</p> <p>Require all residents who cook with fuelwood to use improved stoves.</p>

Potential Adverse Impact	Mitigation Measures
Houses inappropriate for local climate; occupant comfort inadequate	Ensure that the design, construction materials, and siting of windows and doors takes local climatic conditions in cool and hot seasons and seasonal variation in precipitation and winds into account. Use local materials if possible.
Ventilation inadequate	Design houses to ensure adequate ventilation for the potential heating and cooking sources to be used within the home. Take advantage of wind direction in design.
Inadequate attention to type and location of solid waste disposal	Prepare and implement a <i>Solid Waste Disposal Management Plan</i> prior to resident occupancy. Include technology and funding for system maintenance and disposal, effects on groundwater, wind direction, etc. in the plan.
Health hazards due to lack of sanitation facilities (water, sewage and solid waste disposal)	Sanitation facilities <i>must</i> be included in the project design. Ensure that all sanitation facilities are installed and running before the occupants move in.
Unsafe potable water supplies	Ensure siting of supply systems and choice of supply technologies to minimize health hazards. Conduct seasonal testing of water quality, particularly for coliform bacteria and arsenic. Assess long-term and seasonal shifts in water quantity and quality.
Hazard due to inadequate earthquake resistance or inappropriate materials	Understand local risks of earthquake, floods and winds. Ensure that construction meets appropriate standards. Use locally available materials. Follow, or exceed, official design criteria.
Social impacts within and around the project site	A social analysis of the beneficiaries and the communities around the proposed site must be conducted implemented before the project is designed. If the site's location generates too much social conflict, an alternative site must be selected. Community development programs must be implemented in each community before or during the construction process.
Lack of compliance with mitigation measures	Collect signed binding agreements from the collaborating organizations and contractors before the project begins. Each NGO or partner must have an environmental management plan to ensure compliance with the mitigation measures. Have an independent evaluation of the plan conducted annually.

Construction

Potential Adverse Impact	Mitigation Measures
Risk of injury to workers/local inhabitants from construction	Insure that workers have proper protective equipment (noise and dust protection, boots, gloves, etc.) and follow sound safety practices (e.g., use safety ropes, practice proper blasting safety) as appropriate. Insure that pits are covered or that access to them is impeded during construction. Excavate and rebury trenches quickly. Manage quarry slopes to avoid cave-ins.
Interruption to local transportation	Schedule construction for low-traffic days or hours; stagger construction to dilute the impacts of road closure. Conduct work to permit at least alternating one-way road passage.
Noise	Schedule work so as to minimize noise. Use less noisy construction techniques.
Dust or mud	Spread water to keep dust down. Drain areas prone to mud. If possible, schedule land-clearing, excavation and similar activities to avoid extremely dry and extremely wet conditions.
Breeding grounds for insect vectors (e.g., standing water in borrow pits; demolition debris)	Excavate and rebury trenches quickly. Arrange for construction or demolition debris to be permanently disposed of away from watercourses. Fill borrow pits or assure their drainage. Use shallow wells or streams for construction water rather than diverting natural flows to the construction site.

Potential Adverse Impact	Mitigation Measures
Erosion during construction of houses and access roads	Soil conservation measures must be included in the design and implemented during construction. The exact means will depend on the site and the severity of the impact. Install checks and barriers (e.g., berms, hay bales or other vegetation) to trap sediment runoff and revegetate disturbed areas.
Lack of compliance with mitigation measures	Collect signed binding agreements between the collaborating organizations and contractors before the project begins. Each responsible NGO or other partner must have an environmental management plan to ensure compliance with the mitigation measures. Have an independent evaluation of the plan conducted annually.

Habitation

Potential Adverse Impact	Mitigation Measures
Improper use of environmental and sanitary resources by householders	If applicable, the responsible NGOs and partners must provide environmental and sanitary training for all residents before they move in. Training should address all of the following: <ul style="list-style-type: none"> • Environmental education for children • Care of domestic animals • Reforestation of green areas • Proper use and maintenance of latrines • Social interactions in housing projects • Proper use and conservation of water • Construction and use of improved stoves • Fuelwood plot management
Lack of compliance with mitigation measures	Collect signed binding agreements between the collaborating organizations and contractors before the project begins. Each responsible NGO or other partner must have an environmental management plan to ensure compliance with the mitigation measures. Have an independent evaluation of the plan conducted annually.

Resources and References

Two types of resources are provided in this section: those concerned with disaster prevention management, and those concerned with construction standards.

Disaster prevention and management.

Resources in this area are organizations and Web sites, rather than specific documents. The Web sites are intended as portals for accessing a wide variety of documents and technical resources.

Documentation of best practice in disaster reconstruction can be accessed via the Best Practices Database (www.bestpractices.org), offered by the UN Commission on Human Settlements (UNCHS and the Together Foundation). Access to abstracts is free.

Technical guidance

Online technical guidance on appropriate and disaster-resistant housing is scarce. In English, ITDG Publishing's online "Development Bookshop" service (www.itdg.org) serves as a single point of search (and ordering) for this and other technical, development-related subjects. (Note, however, that books ship by post.)

Social Baseline Survey: SAMPLE
For potential occupants of new housing and potentially affected local populations

Note: This survey assumes construction of new housing units, rather than repair of existing structures. The survey should be modified if for projects oriented toward repair only. not all elements of the survey will be applicable to all projects or programs. The survey should be modified according to the needs of the particular activity. Some questions—e.g., those pertaining to demographics or land tenure—may be sensitive and should be pursued using the best judgment of the individual administering the survey.

The survey should be administered to the following groups:

- **Where specific future occupants can be identified**, this questionnaire should be completed for at least 10 percent of the future families, with a minimum of 20 families surveyed, even for small projects. Group interviews are acceptable.
- **If specific future occupants cannot be identified**, then representative potential occupants can be interviewed. If interviews are not possible, the survey can be completed for an “average” occupant using expert knowledge.
- **A representative sample (10 to 20 families) in communities (e.g., clusters of more than 50 houses) within a 1 km radius of the project site** should also complete this survey. The sample should include teachers, representatives of municipal authorities and water board members. The questionnaire can be conducted individually or in groups. For this group, “current residence” should be substituted in questions regarding “previous residence.”

General Information

Name of the project: _____ Date _____
Location: _____ (District/Municipality/Department)
Name of surveyor: _____
Type of respondent(s): _____ occupant or possible occupant
_____ potentially affected local population
If local population, name of community _____
Population (est.) _____
Distance from project site: _____
Type of consultation: _____ Organized group _____ (name of group)
_____ Non-formal consultation
Number of persons consulted: _____

Questions

A. If respondent(s) are potentially affected local population, ask if they are aware that a housing project is planned nearby. Yes _____ No _____

1. In your opinion, what are the most important benefits of the project?

2. In your opinion, what are the problems associated with the project?

3. Are there any indications of archeological/historical/culturally important sites in the area of the project?
Yes ____ No ____

4. What do you cook with? (check all that apply; if multiple fuels, indicate % of time each is used)

Fuelwood	Charcoal	Kerosene	Gas	Electricity

If the answer is fuelwood:

- What kind(s) of trees do you use? _____
- Who collects it? _____
- Where? _____
- Is wood plentiful or scarce? _____
- Average time per day spent obtaining wood? _____

5. Which of the following did your previous (current) residence have? (check all that apply)

Utility or amenity	Y/N	(Hours/day)
Electricity		
Piped water—in home		
Piped water—community tap		
Private latrine		
Community latrine		
Private toilet		

- If latrine, what type? Simple pit _____ Composting _____ Hydraulic _____

6. What were the walls of your residence made of? (check all that apply)

Wattle and daub	Mud Brick	Concrete Block	Wood	Other (specify)

7. What was the floor made of?

Tile	Cement	Dirt	Other (specify)

8. What was the roof made of?

Corrugated metal	Thatch	Tile	Other (specify)

8. What was your source of water? (check all that apply)

River	Stream	Spring	Hand well	Borehole	Piped

- Is water scarce in the dry season? Yes ____ No ____
- **For potentially affected local population:** Do you think there will be enough water for your community and the new project? Yes ____ No ____

9. What are the most common diseases in the area where you live? (check all that apply, solicit detail if possible)

Disease	Y/N	Comments
Respiratory ailments		
Diarrhea		
Malaria		
HIV/AIDS		
Other		

10. Did you consider any of the following to be problems in your community? (check all that apply)

Issue	Y/N	Comments
Water scarcity		
Contaminated river or well water		
Standing water		
Sewage		
Solid waste		
Scarcity of fuelwood		
Deforestation		
Erosion		
Decline in land fertility		
Fires		
Landslides		
Flooding		
Disappearance of fish and game animals		
Insects and animals that carry disease		

11. Household demographics

Datum	#	Comments
# of individuals in household		

# of children <5		
# of children 5–10		
# of children 11–16		
# of children in school		

Environmental Baseline Survey

SAMPLE

General Information

Name of the Project: _____

Date _____

Location: _____

Name of Surveyor: _____

Survey data

1. Land use and tenure

Datum	Surveyor's characterization	Notes
Current land use at proposed site		Change in land use can cause conflict, e.g., if the land is currently being used by a neighboring community for grazing, planting crops, as a source of water, etc.
Previous land use, if different		Past activities such as hazardous waste dumping can endanger the community.
Ecosystem characterization of current site		
What is the current land tenure/title status?		

2. Proximity issues. Is the site located within 2 km of any of the following?

Facility, habitat or activity	Y/N	Comments
Airport		
Military zone		
Protected areas		
Archeological/ anthropological/ cultural/historical sites		
Forested area		
Important flora/fauna habitat, including:		
▪ wetlands		
▪ tropical rain forest		
▪ mangrove		
▪ coral reefs		
▪ endangered/ endemic species		
Critical biological corridor		
Critical headwaters/		

source for local or downstream water supplies		
Highly polluting or hazardous industrial or mining activity		

3. Vulnerabilities

How does your survey rate the site/area's vulnerability to ...	Surveyor's characterization High/Medium/Low/ Not Applic.	Comments (note any recent natural disasters)
Flooding		
Hurricanes		
Landslides		
Earthquakes		
Forest/Brush fires		
Drought		
Contamination from external sources (industry, agriculture, animal farms, etc.)		
Erosion		

(Medium to high vulnerability will require choice of an alternate site or use of effective mitigation measures)

4. Anticipated source(s) of water

Primary source(s)	Average flow (if well, daily yield)	Lowest seasonal flow	Drinkable without treatment?	Nature of current utilization	% of flow currently utilized
e.g., spring					

Secondary source(s)	Average flow (if well, daily yield)	Lowest seasonal flow	Drinkable without treatment?	Nature of current utilization	% of flow currently utilized
e.g., spring					

5. Soil characteristics and topography

Datum	Surveyor's characterization	Notes
Soil composition/type		This is an important design consideration in waste disposal systems.
Permeability		
Depth of bedrock		

Average slope of site		Slopes greater than 20% are generally unsuitable for housing.
Depth of water table		Important design consideration for both water supply and waste disposal systems, such as wells and latrines.
Superficial, seasonal and/or sub-superficial watercourses in the project area?		Specify depth and location.

6. Climate and weather

Datum	Surveyor's characterization	Notes
Average temperature		Hot weather must be considered when designing a house so it may have proper ventilation.
Rainfall pattern		
Average yearly rainfall		
Predominant wind direction		Important for ventilation and the location of waste disposal systems.

7A. Characteristics of the built environment

Datum	Surveyor's characterization	Notes
Distance to nearest road		The community must have proper access to work, school and health centers.
Distance to public transportation		
Are there other communities within 2 km of proposed site? (Y/N)		If yes, fill out table below.

7B. Facilities and infrastructure of communities within 2 km of proposed site. List the facilities these communities have, including hospitals, health centers, schools (specify levels), waste disposal systems, houses of worship (specify denominations), recreational centers and government offices.

Community name	Distance	Approximate population	Facilities and utilities

8. Topographic mapping. The site must be marked on a topographical map, preferably scale 1:50,000. Water bodies, existing settlements and infrastructure, and facilities, habitats or activities identified under “proximity issues” must be clearly identified.

Preliminary project profile

Complete the following project profile.

1. General Information

Name of the project: _____ Date _____

Organization: _____

Contact: _____ (name and position)
_____ (address)
_____ (tel/fax/e-mail)

2. Land title

Has title to the entire site been secured? Yes _____ No _____

3. Basic characteristics/site plan

Characteristic	Estimate	Comments
Total area (ha)		
Lot size		
Number of houses		
Persons/household		
Total population		
Water/person/day		
Total estimated water demand		
Percent of area designated for:		
• internal roads		
• green area		
• community/ recreational areas		
• transport facilities		

4. Basic construction of housing units

House element	Material	Comments
Floors		e.g., dirt/cement/tile
Roof		e.g., corrugated sheet, tile, tarp
Walls		e.g., adobe, cement block

5. Planned utilities and sanitation

Utility		Comments
POTABLE WATER		
• planned potable water source		i.e., community well, community borehole, rainwater collection, spring, stream, pipe-borne/community tap,

		pipe-borne/private connections, water trucks
<ul style="list-style-type: none"> daily source capacity, seasonal low 		
COOKING		
<ul style="list-style-type: none"> cooking fuel 		Firewood, charcoal, kerosene, electricity, bottled gas
ELECTRICITY		
<ul style="list-style-type: none"> source 		National grid/solar battery/local diesel set/none
<ul style="list-style-type: none"> source capacity 		kW or kW/hr, as appropriate
<ul style="list-style-type: none"> availability 		All day; all hours; evenings only; etc.
<ul style="list-style-type: none"> public lighting? 		Y/N; anticipated load
<ul style="list-style-type: none"> house connections? 		Y/N; anticipated load per house
SOLID WASTE		
<ul style="list-style-type: none"> mode of collection/transport 		
<ul style="list-style-type: none"> final disposal 		Incinerator, landfill, other
WASTE WATER		
<ul style="list-style-type: none"> graywater 		
<ul style="list-style-type: none"> sewage 		
RAINWATER DRAINAGE		How will rainwater runoff be managed?
SANITARY FACILITIES		
<ul style="list-style-type: none"> communal or individual household? 		
<ul style="list-style-type: none"> type 		e.g., improved pit latrines, composting latrines

6. Administration and funding of utilities and sanitation. Indicate the institution which will administer each of these services and *how they will be funded*.

	Potable water	Solid Waste	Sewage	Electricity
Local government				
Community organization				
NGO				
National, regional or municipal utility				

7. Social services from the built environment

Schools	
Projected # of school-age children	
Does project plan include a school? (Y/N)	
If no:	

<ul style="list-style-type: none"> distance to nearest school(s) 	
<ul style="list-style-type: none"> do nearest school(s) have sufficient excess capacity 	

Health post/clinic	
Does project plan include a clinic/health post?	
If no, distance to nearest health post	